

TANK WITH AUTOMATIC FILL AND OVERFILL DRAIN**BACKGROUND OF THE INVENTION****1. Field of the Invention**

The present invention relates to an automatic fill water level control device and an overfill drain device for use with a swimming pool to obtain a desired pool water level. More specifically, the invention relates to a tank that is in communication with a pool and contains an adjustable automatic fill device and an overfill drain device in a fixed relationship to each other, so that setting the level of one of the devices automatically sets the level of the other device.

2. Related Art.

Conventional pools contain overfill drains constructed as follows. A drain pipe is placed in the pool wall at the height of the desired water level. The drain pipe terminates either on the land surrounding the pool or into a nearby drain. Leaves and other debris floating on the pool water surface can plug the outlet hole in the pool wall, compromising the efficiency of the overfill drain.

U.S. Patent No. 4,621,657 discloses a monitoring system for a swimming pool including a chamber in communication with the pool, adjustable fill means for determining a desired water level for the pool, and an overflow pipe for draining water from the chamber when the water level in the chamber exceeds the desired pool water level. The height of the overflow pipe is not fixed in relation to the automatic fill means. One must first set the automatic fill means then secondly adjust the overfill drain to be just slightly higher than the water level set by the automatic fill means.

20161110T062007

Accordingly, it is desirable to provide a device containing an adjustable automatic fill device and an adjustable overfill drain device that are in fixed relation to each other and can be simultaneously adjusted to determine and adjust the desired water level in a pool.

SUMMARY OF THE INVENTION

The invention is directed to a device for adjusting the water level in a swimming pool including a tank that is in communication with the pool and contains an automatic fill device and an overfill drain device in fixed relation to each other. Providing the devices in a fixed relationship allows the height of both devices to be simultaneously adjusted to obtain a desired water level in the pool.

Other objects, features and advantages of the present invention will be apparent to those skilled in the art upon a reading of this specification including the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is better understood by reading the following Detailed Description of the Preferred Embodiments with reference to the accompanying drawing figures, in which like reference numerals refer to like elements throughout, and in which:

FIG. 1 is a cross-sectional elevational view of a conventional skimmer tank and the inventive device.

FIG. 2 is a top plan view of the inventive device.

FIG. 3 is a side view of the overflow means of the inventive device.

FIG. 4 is a side view of the overflow means of the inventive device.

FIG. 5 is a side view of the automatic fill means of the inventive device.

FIG. 6 is a side view of the adjusting means of the inventive device.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In describing preferred embodiments of the present invention illustrated in the drawings, specific terminology is employed for the sake of clarity. However, the invention is not intended to be limited to the specific terminology so selected, and it is to be understood that each specific element includes all technical equivalents that operate in a similar manner to accomplish a similar purpose.

The inventive device, designated device 10, includes a tank 12 that is in communication with a pool 18 via an equalizer line 16. Tank 12 is a relatively no flow chamber, and the water level in tank 12 is equal to the water level in pool 18. Tank 12 contains an automatic fill device 20 and an overfill drain device 60. Automatic fill device 20 allows water to enter the tank 12 and pool 18 when the water level of tank 12 and pool 18 reaches a preselected lower level. Overfill drain device 60 allows water to drain out of tank 12 and pool 16 when the water level of tank 12 and pool 16 reaches a level higher than that set by the automatic fill device. This would occur during a rainstorm. As described in detail below, automatic fill device 20 and overfill drain device 60 are in fixed relation to each other within tank 12, so that the height of both devices can be simultaneously adjusted to obtain a desired water level in the pool. Setting the height of one of the devices automatically sets the height of the other device.

As illustrated in FIG. 1, device 10 is preferably located adjacent to a conventional circular skimmer tank 100 which is in communication with pool 18 via passageway 104. A conventional skimmer weir 120 is hingedly connected to floor 110 of passageway 104 at the

entrance to pool 18. Skimmer tank 100 also includes a skimmer basket 122 for retaining leaves and debris that are drawn into skimmer tank, and a drain pipe 124.

Equalizer line 16 connects tank 12 (a relatively no flow chamber) to passageway 104 of skimmer tank 100 (a positive pressure area) so that tank 12 is in communication with pool 18 and the water level in tank 12 is equal to that in pool 18. A filter screen 112 is preferably provided over the opening  of equalizer line 16 to prevent leaves and debris from clogging equalizer line 16 and from entering tank 12 and clogging overfill drain device 60. During operation, filter screen 112 is back flushed every time automatic fill device 20 is activated to allow water to enter tank 12.

As illustrated in FIG. 2, tank 12 has first, second, third and fourth sides 12a, 12b, 12c, 12d. Side 12c has wall connectors (not shown) for incoming and outgoing water. First side 12a is preferably concave, and configured so that first side 12a fits adjacent to the convex outer surface of circular skimmer tank 100. Locating device 10 adjacent skimmer tank 100 allows for easy access to device 10. Tank 12 may have a lid 13, or may be formed as part of skimmer tank 100 and share a common lid with skimmer tank 100.

Tank 12 contains automatic fill device 20 and overfill drain device 60 in a fixed relationship to each other. This can be accomplished by numerous designs in which automatic fill device 20 and overfill drain device 60 are connected to each other so that their height can be simultaneously adjusted.

By way of illustration and for exemplary purposes only, automatic fill device 20 and overfill drain device 60 can be mounted on an adjustable plate 80 so that the height of automatic fill device 20 and overfill drain device 60 can be simultaneously adjusted via plate 80, as follows. First and second protrusions 14a, 14b extend vertically outwardly from first and second

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sides 12a, 12b of tank 12. First and second protrusions 14a, 14b slidably receive a portion of plate 80 and act as guide means for adjusting the height of plate 80, as follows. First and second ends 80a, 80b of plate 80 are slidably inserted between fourth side 12d of tank 12 and first and second protrusions 14a, 14b. Plate 80 is held in place against fourth side 12d of tank 12 by adjusting means 84. To adjust the desired pool level, the heights of automatic fill device 20 and overfill drain device 60 are simultaneously adjusted by backing off adjusting means 84, moving plate 80 to a desired position within tank 12 and engaging adjusting means 84 to lock and hold plate 80 in place in the desired position.

Adjusting means 84 may be a knob 86 attached to a screw 88 that extends through a threaded hole in plate 80, as illustrated in FIGS. 2 and 6. Plate 80 is held at a desired height in tank 12 by turning knob 86 in a first direction so that end 88a of screw 88 engages fourth side 12d of tank 12. To adjust the desired pool level, the height of automatic fill device 20 and overfill drain device 60 is simultaneously adjusted by turning knob 86 in a second direction to disengage end 88a of screw 88 from fourth side 12d of tank 12, sliding plate 80 vertically upward or downward to a desired pool water level, and turning knob 86 in the first direction to engage end 88a of screw 88 against fourth side 12d of tank 12.

Adjusting means 84 can be any other means suitable for adjusting the height of plate 80 and locking it in a desired position within tank 12. For example, one might utilize a threaded rod vertically attached to a common member of plate 80. The rod would have a knob on the top end, and by swivel means be held to the floor of the tank. Turning the knob in one direction raises the device, and turning the knob in the other direction lowers the device. Although the drawings show plate 80 in a vertical plane, it is to be understood that plate 80 could be guided in a horizontal plane, with mechanical means for raising, lowering and locking the device.

Automatic fill device 20 allows water to enter tank 12 and pool 18 (via equalizer line 16) when the water level in tank 12 and pool 18 falls below a set level. As illustrated in FIGS. 2 and 5, automatic fill device 20 includes a float valve 22 having a float arm 24 with first and second ends 24a, 24b, a conventional valve 26 attached to first end 24a and a float ball 28 attached to second end 24b. Float ball 28 floats at the surface of the water in tank 12. A stop arm 30 is attached at its first end 30a to valve 26. Stop arm 30 may be attached to valve 26 by fasteners 32, such as screws, or any other suitable means. Second end 30b of stop arm 30 is engaged with float arm 24 when the water in tank 12 is at a higher level than desired, such as in a rain storm. Stopping the float arm 24 in the horizontal position prevents the valve 26 from adding still more water to the pool 18.

Valve 26 is connected to first end 40a of vertically oriented pipe 40. Second end 40b of vertically oriented pipe 40 is connected to first end 42a of elbow-shaped connector pipe 42. Second end 42b of connector pipe 42 is attached to a water source (not shown) that is external to tank 12.

Valve 26 is closed when second end 30b of stop arm 30 is engaged with float arm 24. When the water level in tank 12 drops and falls below the preselected level, float arm 24 rocks the seal of valve 26, thereby breaking the seal, opening valve 26 and allowing water from the external water source (not shown) to move through connector pipe 42, up through vertically oriented pipe 40 and out valve 26 into tank 12.

During heavy rain conditions when the water level in tank 12 and pool 18 rises above the preselected water level, stop arm 30 prevents float arm 24 from rising with the water above the preselected level, thereby preventing float arm 24 from opening float valve 26 and allowing

water to enter tank 12. This prevents automatic fill device 20 from counteracting the drainage action of overfill drain device 60 during heavy rain conditions.

Overfill drain device 60 allows excess water to drain out of tank 12 and pool 18 when the water level is higher than the preselected water level set by adjusting the height of automatic fill device 20 and overfill drain device 60 in tank 12 via plate 80. As illustrated in FIGS. 3 and 4, overfill drain device 60 includes a vertically oriented hollow pipe attached to adjustable plate 80. First end 62a of pipe 62 is open, forming an inlet. Second end 62b of pipe 62 is attached to first end 64a of elbow pipe connector 64. Second end 64b of elbow pipe connector 64 is attached to first end 70a of hose 70. Second end 70b of hose 70 is connected to overfill drain pipe 72 which passes through outlet 74 formed in tank 12. Clamps 68 may be used to securely connect first end 70a of hose 70 to second end 64b of elbow connection pipe 64 and second end 70b of hose 70 to overfill drain pipe 72. Hose 70 may be looped, as illustrated in FIG. 3, so that it can flex with the movement of plate 80 if a new water level is selected.

The desired water level is selected by adjusting the height of automatic fill device 20 and overfill drain device 60 via plate 80 so that the valve 26 will be at the desired water level. 'Float ball 28 is preferably weighted so that it rides half out of the water and half under water. This keeps the float arm 24 in a horizontal position on the surface of the water when the valve 26 is closed. When the water level in tank 12 rises above the preselected water level, such as during a rain storm, the excess water drains out of tank 12 and pool 18 through first end 62a, pipe 62, elbow pipe connector 64, hose 70, overfill drain pipe 72 and out outlet 74 to the surrounding ground or a drain located outside of tank 12.

Locating outlet 74 for overfill drain device 60 outside of pool 18 avoids the problem of leaves and debris from the pool clogging the outlet, and eliminates the necessity of providing a

separate pipe through the pool wall for overfill drain device 60. It is to be understood that automatic fill device 20 is connected to an outside water source by a hose as shown in FIG. 3 for the overfill drain.

Modifications and variations of the above-described embodiments of the present invention are possible, as appreciated by those skilled in the art in light of the above teachings. For example, tank 12 may be formed as part of skimmer tank 100, automatic fill device 20 and overfill drain device 60 can be connected in fixed relation to each other by any conventional means, and adjusting means 84 can be any suitable means for adjusting the height of automatic fill device 20 and overfill drain device 60. It is therefore to be understood that, within the scope of the appended claims and their equivalents, the invention may be practiced otherwise than as specifically described.